

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	IB Docket No. 02-10
Procedures to Govern the Use of Satellite)	
Earth Stations on Board Vessels in the 5925-)	
6425 MHz/3700-4200 MHz Bands and 14.0-)	
14.5 GHz/11.7-12.2 GHz Bands)	
To: The Commission		

COMMENTS OF STRATOS OFFSHORE SERVICES COMPANY

Alfred M. Mamlet
Carlos M. Nalda
Steptoe & Johnson LLP
1330 Connecticut Avenue, NW
Washington, DC 20036
(202) 429-3000

*Counsel for Stratos Offshore Services
Company*

February 23, 2004

SUMMARY

Stratos Offshore Services Company (“Stratos”) supports the Commission’s efforts to implement domestically the results of the 2003 World Radiocommunication Conference (“WRC-03”) regarding the use of earth stations on board vessels (“ESVs”) in C-band and Ku-band spectrum, consistent with the overriding need to protect primary terrestrial services from harmful interference. ESVs should provide substantial public benefits by delivering broadband services to vessel crew and passengers using C-band and Ku-band Fixed-Satellite Service (“FSS”) frequencies, and by facilitating the efficient and flexible use of spectrum. However, the Commission must be mindful of the significant differences in terrestrial use of C-band and Ku-band spectrum in the United States, and should implement an ESV regulatory regime that fully accounts for these differences.

Specifically, Stratos believes that the Commission should authorize C-band ESV operations on a non-harmful interference basis with respect to primary U.S. terrestrial services pursuant to both the proposed Non-Coordination and Coordination licensing approaches, but afford C-band ESVs co-primary status vis-à-vis other services. The C-band offers unique operational benefits to ESV operators, including transoceanic satellite coverage, and the Commission should not unduly restrict or prohibit use of this band or transition ESV services in and around the United States to the Ku-band. Instead, the Commission should ensure that C-band ESVs protect primary terrestrial operations and do not restrict the ability of terrestrial licensees to implement new systems and services, including U.S.-licensed C-band microwave facilities on deep-water platforms in the Gulf of Mexico.

The Commission should authorize Ku-band ESV operations on a primary basis, subject to protecting co-frequency government Space Research and Radio Astronomy operations, and should eliminate the unnecessary Local Television Transport Service (“LTTS”) allocations in the Ku-band. Furthermore, because the Ku-band is ideal for providing broadband ESV services on U.S. inland waterways and in coastal regions, the Commission should not impose a minimum vessel size for Ku-band ESVs.

An appropriate ESV licensing regime also should include blanket licensing of ESVs subject to compliance with U.S. off-axis e.i.r.p. limits and operational requirements of Resolution 902 (WRC-03), coordination of ESVs pursuant to International Telecommunication Union (“ITU”) recommendations, and ESV licensee responsibility and control over ESVs operating with its network, including those on foreign licensed ships. Through these and other measures discussed herein, the Commission can ensure that the benefits of C-band and Ku-band ESV services can be realized in the United States, consistent with the protection of incumbent terrestrial operations.

TABLE OF CONTENTS

Summary	i
I. INTRODUCTION.....	1
II. BACKGROUND AND RECENT DEVELOPMENTS RELATING TO ESV REGULATION	4
III. THE COMMISSION SHOULD ADOPT ESV RULES CONSISTENT WITH THE UNIQUE OPERATIONAL CIRCUMSTANCES AT C-BAND AND KU- BAND.....	7
A. ESV Operations in the C-Band Are Necessary to Offer Vital Open Ocean Region Service	9
B. C-Band Sharing Issues	10
1. Non-Coordination Approach.....	10
2. Coordination Approach	12
3. Minimum Distance.....	15
C. Ku-Band Spectrum Sharing Issues.....	16
1. 11.7-12.2 GHz Band.....	17
2. 14.0-14.5 GHz Band.....	18
IV. THE COMMISSION SHOULD ADOPT BLANKET LICENSING PROCEDURES FOR ESV OPERATIONS BASED ON THE UNIQUE OPERATIONAL CHARACTERISTICS OF THE SERVICE.....	19
V. OTHER OPERATIONAL CONSIDERATIONS FOR ESV NETWORKS	21
VI. CONCLUSION	24

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of:)	
)	IB Docket No. 02-10
Procedures to Govern the Use of Satellite)	
Earth Stations on Board Vessels in the 5925-)	
6425 MHz/3700-4200 MHz Bands and 14.0-)	
14.5 GHz/11.7-12.2 GHz Bands)	

To: The Commission

COMMENTS OF STRATOS OFFSHORE SERVICES COMPANY

Stratos Offshore Services Company (“Stratos”), by its attorneys, hereby files these comments in the above-captioned proceeding.¹ Stratos supports the Commission’s efforts to implement domestically the results of the International Telecommunication Union (“ITU”) 2003 World Radiocommunication Conference (“WRC-03”) regarding the use of earth stations onboard vessels (“ESVs”), consistent with the overriding need to protect incumbent terrestrial services from harmful interference caused by ESVs. The Commission should adopt rules to permit U.S.-licensed ESV operations in C-band and Ku-band Fixed-Satellite Service (“FSS”) spectrum that will promote the public interest by facilitating the deployment of maritime broadband communications services, while ensuring interference-free operation and preserving opportunities for expansion of critical terrestrial communications infrastructure.

I. INTRODUCTION

As the Commission is aware, Stratos is a global satellite and microwave communications service provider that operates its own telecommunications facilities and is a value-added reseller

¹ See Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in the 5925-6425 MHz/3700-4200 MHz Bands and 14.0-14.5 GHz/11.7-12.2 GHz Bands, *Notice of Proposed Rulemaking*, IB Docket No. 02-10, FCC 03-286 (rel. Nov. 24, 2003) (“*NPRM*”).

of telecommunications services provided by others. Stratos and its affiliates specialize in Mobile-Satellite Service (“MSS”), FSS and terrestrial fixed communications solutions for government, commercial and private customers with communications needs that extend beyond the reach of traditional terrestrial telecommunications networks. Of particular relevance to this proceeding, Stratos provides a wide range of communication services to oil and gas exploration and production operations in the Gulf of Mexico region using a state-of-the-art C-band digital microwave system.² Stratos also offers Ku-band VSAT services in the Gulf region and beyond to provide access to critical voice/fax, broadband data, video and high-speed Internet communications capabilities to its customers.³

Stratos supports the Commission’s effort to facilitate the development of broadband maritime communications services using C-band and Ku-band ESVs. As the Commission noted in the *NPRM*, ESV networks will provide significant public benefits by delivering broadband services to vessels at sea and in port,⁴ and will promote the efficient and flexible use of the limited spectrum resource by permitting maritime broadband services in C-band and Ku-band FSS frequencies.⁵ Indeed, Stratos believes that ESVs can become an important component of its maritime communications services offering. Stratos has conducted operational tests of ESVs

² The Stratos microwave network reaches from Port Mansfield, Texas to the coast of Alabama and southward towards deepwater sites in the Gulf of Mexico. The facilities operate pursuant to various Commission licenses. *See e.g.*, FCC Call Signs WNTF603, WP0S343, WPOS344, WPOS345, WPOS346, WPOS347, WPOS348, and WPOS349.

³ *See* FCC File Nos. SES-MOD-19980710-00857 (FCC Call Sign E950135); SES-LIC-19951013-00309 (FCC Call Sign E960147); SES-MOD-19980622-00725 (FCC Call Sign E950150); SES-MOD-19980710-00858 (FCC Call Sign E950136) (all of the above authorized are licensed to Stratos VSAT, Inc.); *see also* FCC File No. SES-LIC-19980507-00546 (FCC Call Sign E980235) (licensed to Stratos Offshore Services Company).

⁴ *See NPRM* at ¶ 23.

⁵ *See id.*, ¶¶ 1, 59, 105.

under an FCC experimental authorization and has an application to add ESVs to its licensed Ku-band VSAT network currently pending before Commission.⁶

Stratos also operates an extensive C-band (6 GHz) microwave network in the Gulf of Mexico region. Among other things, these facilities provide critical communications services between inland commercial centers (*e.g.*, Houston, TX; New Orleans, LA; and Lafayette, LA) and a large number of offshore oil and gas platforms located more than 100 miles from the U.S. coastline. There are major shipping lanes running near and through many of these microwave links. As a result, Stratos is keenly aware of the need to protect U.S.-licensed C-band microwave operations located near the U.S. coastline, along inland waterways and in the Gulf of Mexico; and Stratos is uniquely situated to comment on the important issues raised by the Commission in the *NPRM* with respect to C-band ESV operations.

Given the public benefits associated with ESV services, the Commission should adopt rules that permit ESV operations in both C-band and Ku-band FSS frequencies. Stratos believes that the development of licensing and service rules for ESV operations should be guided by the following general principles:

- authorize C-band ESV operations within the 300 kilometer minimum distance from the U.S. coastline on a non-harmful interference basis with respect to U.S.-licensed co-frequency terrestrial services, but afford C-band ESV operations primary status while operating beyond the minimum distance and vis-à-vis other services;
- authorize Ku-band ESV operations on a primary basis, subject to protecting co-frequency government operations, and eliminate certain unnecessary secondary allocations in the Ku-band;

⁶ See FCC File Nos. 0300-EX-ST-2003, 0011-EX-TU-2003 (FCC Call Sign WB9XUG); *see also* FCC File No. SES-MOD-20031008-01387 (FCC Call Sign E980235) (requesting authority to add ESVs to its licensed Ku-band VSAT network); *see also* Public Notice, Report No. SES-00554, (rel. Oct. 22, 2003) (announcing that the application has been found, upon initial review, to be acceptable for filing).

- recognize that C-band and Ku-band ESVs have distinct operational circumstances and offer unique operational benefits, and therefore ESV services should be permitted in both C-band and Ku-band FSS spectrum;
- base the U.S. ESV regulatory regime on the technical and operational provisions adopted by WRC-03 to protect terrestrial services, subject to the overriding need to preserve the flexibility of incumbent C-band terrestrial licensees to implement new systems and services.

Stratos addresses these principles more fully below in its comments on some of the specific proposals made by the Commission in the *NPRM*.

II. BACKGROUND AND RECENT DEVELOPMENTS RELATING TO ESV REGULATION

ESV licensing issues have been before the Commission for more than a decade. In December 1991, Crescomm Transmission Services, Inc. (“Crescomm”)⁷ filed a petition for rulemaking to license ESVs to communicate with land-based earth stations in the C-band and Ku-band.⁸ In the 1996 *Crescomm Order*, the Commission granted waivers of the Commission’s rules to Qualcomm, Inc. (“Qualcomm”)⁹ and MTN to provide maritime MSS service using C-band and Ku-band frequencies.¹⁰ Since that time, the Commission generally has authorized ESV operations pursuant to a special temporary authorization (“STA”) on a non-interference basis

⁷ Crescomm subsequently changed its name to Maritime Telecommunications Network, Inc. (“MTN”).

⁸ See Crescomm Transmission Services, Inc., Petition for Rule Making and Request for Pioneer Preference, RM-7912 (filed December 12, 1991).

⁹ Qualcomm filed a request for waiver of the Table of Frequency Allocations to allow it to provide satellite-based communications to ships in the Ku-band via its OmniTRACS system. See Mobile Satellite-Based Communications Services by Crescomm Transmission Services, Inc., and Qualcomm Incorporated, *Order*, 11 FCC Rcd 10944, 10946-47, ¶ 7 (Int’l Bur./OET, 1996).

¹⁰ See *id.*, ¶ 9.

only.¹¹ The Commission has also granted other ESV authorizations,¹² and a number of ESV applications remain pending before the Commission.¹³

Given the growing interest in ESV operations in recent years, the Commission sought comments in a 2002 Notice of Inquiry (“NOI”) proceeding on ESV licensing and allocation issues.¹⁴ In that proceeding, ESV proponents supported licensing ESVs in both the C-band and Ku-band, and urged the Commission to establish a regulatory framework for ESVs, and generally supported the recommendations being developed in the ITU-R to govern ESV operations. The Fixed Wireless Communications Coalition (“FWCC”),¹⁵ however, opposed the licensing of ESVs in the C-band because of concerns about the potential for ESVs to interfere with and limit the growth of terrestrial systems located near port cities and coastal areas. In addition, FWCC noted that it is difficult to determine if interference to terrestrial facilities is

¹¹ See generally *NPRM* at ¶ 9. For example, the Commission recently MTN authority to operate ten ESVs on U.S.-flagged vessels in the Ku-band on a non-harmful interference basis. See *Maritime Telecommunications Network, Inc.*, File No. SES-STA-20031209-01841 (effective 12/22/03 through 6/17/04).

¹² See, e.g., FCC File No. SES-LIC-20020326-00543 (FCC Call Sign E020095).

¹³ See, e.g., FCC File Nos. SES-MOD-20031008-01387 (FCC Call Sign E950135) (application of Stratos Offshore Services Company); SES-LIC-20011130-02259 (FCC Call Sign E010332) (application of Maritime Telecommunications Network, Inc.); SES-LIC-20021028-01926 (FCC Call Sign E020303) (application of Data Marine Systems, Inc.)

¹⁴ *Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in Bands Shared with Terrestrial Fixed Service*, Notice of Inquiry, 17 FCC Rcd. 2646 (2002).

¹⁵ The FWCC is a coalition that includes trade associations whose members operate stations in the FS and commercial mobile radio services; manufacturers of FS equipment; frequency coordinators; and other members including state and local law enforcement agencies; electric, gas, and water utilities; railroads; pipeline and petroleum exploration companies.

caused by ESVs because terrestrial microwave operators do not have a means to positively identify and determine where ESV-equipped vessels are operating at any given time.¹⁶

The Radiocommunication Sector of the International Telecommunication Union (“ITU-R”) recently adopted regulatory and technical requirements to permit ESV operations using C-band and Ku-band FSS frequencies.¹⁷ Specifically, WRC-03 added a footnote to the International Table of Frequency Allocations that authorizes the use of ESVs with space stations in the FSS in the 5925-6425 MHz and 14.0-14.5 GHz bands,¹⁸ and adopted Resolution 902, which established regulatory and operational requirements for C-band and Ku-band ESVs.¹⁹ Specifically, Resolution 902 includes a pointing accuracy requirement and a maximum off-axis e.i.r.p. density on ESV emissions to limit interference into other FSS networks; as well as a minimum antenna diameter, power limits towards the horizon, and minimum distances beyond which an ESV may operate without prior agreement of a potentially concerned administration to limit interference into primary terrestrial services.²⁰

Given that the ESV requirements developed in the ITU-R are based on exhaustive technical studies and regulatory discussions conducted over the last several years, the Commission may generally base its ESV licensing and service rules on the provisions adopted at WRC-03. However, it must also consider unique spectrum sharing circumstances at C-band and

¹⁶ See generally *NPRM* at ¶¶ 17-20.

¹⁷ See Results of WRC-03 (Satellite Issues), Agenda item 1.26 (Earth-stations on Vessels - ESV) (<http://www.itu.int/ITU-R/conferences/seminars/lusaka-2003/docs/11-results-wrc03.doc>).

¹⁸ See ITU RR 5.457A (WRC-03).

¹⁹ See Resolution 902, Provisions relating to earth stations located on board vessels which operate in fixed-satellite service networks in the uplink bands 5925-6425 MHz and 14-14.5 GHz (WRC-03).

²⁰ See *id.*

Ku-band in the United States, and adopt rules that fully protect co-primary terrestrial operations and other co-frequency services consistent with the public interest.

III. THE COMMISSION SHOULD ADOPT ESV RULES CONSISTENT WITH THE UNIQUE OPERATIONAL CIRCUMSTANCES AT C-BAND AND KU-BAND

In the *NPRM*, the Commission proposes disparate regulatory status for C-band and Ku-band ESVs. Specifically, the Commission proposes to allow ESVs to operate on a primary basis in the Ku-band,²¹ but proposes that C-band ESV operations be on a non-interference basis only vis-à-vis co-primary U.S. terrestrial services.²² Stratos generally agrees with this approach.

Given that FSS services have an exclusive, primary allocation in the 11.7-12.2 GHz and 14.0-14.5 GHz bands,²³ Stratos agrees that Ku-band ESV operations should be authorized on a primary basis and supports adoption of proposed footnote NGyyy. Such regulatory status is consistent with decisions reached at WRC-03 and would permit ESVs to be a recognized

²¹ *NPRM* at ¶ 30. The Commission proposed to add the following non-Federal Government footnote NGyyy to the U.S. Table of Allocations for the 11.7-12.2 GHz and 14.0-14.5 GHz bands: “NGyyy In the bands 11.7-12.2 GHz (space-to-Earth) and 14.0-14.5 GHz (Earth-to-space), earth stations on board vessels (ESVs) may communicate with space stations of the fixed-satellite service on a primary basis. ESV operators shall take all practical steps to comply with ITU Resolution 902 (WRC-03).” *Id.*, ¶ 41.

²² *See id.* at ¶ 30. The Commission proposed to add the following non-Federal Government footnote NGxxx to the U.S. Table of Allocations for 3700-4200 MHz and 5925-6425 MHz bands: “NGxxx In the bands 3700-4200 MHz (space-to-Earth) and 5925-6425 MHz (Earth-to-space), earth stations on board vessels (ESVs) may communicate with space stations of the fixed-satellite service on the condition that such use not cause harmful interference to, claim protection from, or otherwise impose constraints on the operation or development of fixed stations that operate in these bands. ESV operators shall take all practicable steps to comply with ITU Resolution 902 (WRC-03).” *Id.*, ¶ 46.

²³ The 14.0-14.2 GHz band is presently allocated to the Radio Navigation Service on a primary basis, but the Commission has proposed to remove this allocation because it is not significantly used and could potentially conflict with various satellite operations in the band. *See id.* at ¶ 34.

application within FSS networks during inter-system coordination. Such status is critical to the implementation of Ku-band ESV services in the United States and internationally.

Stratos also generally agrees that C-band ESV operations should be authorized on a non-interference basis vis-à-vis co-primary U.S. terrestrial services.²⁴ Existing and future U.S.-licensed 6 GHz microwave links (the C-band terrestrial operations affected by ESV uplinks in the 5925-6425 MHz band) should be fully protected from interference from C-band ESV uplink transmissions. Thus, while Stratos believes that protection can be afforded to terrestrial systems by coordinating with ESV operators, the future expansion of C-band terrestrial systems should not be unduly constrained by ESV operations.²⁵ Through limitations proposed by the Commission (*e.g.*, limiting the amount of FSS uplink spectrum that can be coordinated by ESVs, encouraging frequency coordinators to avoid assigning new C-band microwave operations to frequencies coordinated for ESVs unless there is no alternative available, etc.), the Commission can ensure the protection and continued growth of incumbent terrestrial operations without unduly constraining C-band ESV operations.

²⁴ See *NPRM* at ¶¶ 30, 43. This approach is consistent with the approach taken by the Commission in other proceedings where unique sharing circumstances and the public interest warrant permitting operations of a primary service on a non-interference basis vis-à-vis a co-primary service. *E.g.*, Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-band Frequency Range, First Report and Order and Further Notice of Proposed Rule Making, 16 FCC Rcd. 4096, 4160-4173 (2000) (authorizing NGSO FSS service on a co-primary, non-interference basis with BSS in the 12.2-12.7 GHz band).

²⁵ This is particularly true in the Gulf of Mexico, where additional C-band microwave stations may be needed as oil and gas platforms are repositioned or brought into use, and such new deployment is generally unconstrained by traditional terrestrial/FSS earth station coordination issues.

A. ESV Operations in the C-Band Are Necessary to Offer Vital Open Ocean Region Service

As a preliminary matter, the Commission should not preclude ESV operations in the C-band because that band affords unique operational advantages that the Ku-band generally cannot offer. Most significantly, C-band FSS satellites typically operate using hemispheric beams that provide coverage of the entire visible Earth, including open ocean regions. While Ku-band satellites provide coverage of smaller maritime regions (*e.g.*, the Caribbean and Mediterranean regions) and multiple satellites could possibly be used to provide transoceanic ESV services, only a limited amount of Ku-band transponder capacity offering such coverage may be available. Stratos has military and commercial customers with a significant need for maritime broadband data services on deep-water maritime routes throughout the world, and these needs are best met using the comprehensive coverage offered by C-band satellites.

The ITU has developed procedures to coordinate ESV and terrestrial operations so that incumbent terrestrial services are adequately protected, and the Commission has proposed additional enhanced measures to ensure that future expansion of C-band terrestrial services is not unduly constrained. In addition, while the C-band may be more heavily used by terrestrial services in the United States than the Ku-band, in other countries both C-band and Ku-band frequencies are used by terrestrial services on a primary basis. Adopting policies that unduly restrict use of the C-band in favor of the Ku-band would place U.S.-licensed ESVs at a significant competitive disadvantage abroad, and undermine the United States' leadership position in advanced satellite communications services. Accordingly, there is no reason to prohibit ESV use of C-band frequencies or transition ESVs to the Ku-band with the minimum distance from the U.S. coastline.

Furthermore, prohibiting the use of C-band spectrum within the minimum distance would entail the use of two separate ESVs or a dual-band ESVs, which would substantially increase the cost and complexity associated with each C-band ESV installation. In addition, ESV operators would be required to lease separate C-band and Ku-band transponders that cover the same region, resulting in a higher cost service and inefficient use of spectrum. Furthermore, operation complexity and service interruptions associated with unnecessary satellite transponder switching (C-band to Ku-band) would further undermine the provision of ESV services.

The C-band and Ku-band each offer unique advantages in the provision of maritime broadband communication services, and the Commission should permit ESV operations in both frequency bands consistent with appropriate protection for co-primary services.

B. C-Band Sharing Issues

The Commission has proposed two licensing approaches for C-band ESVs: a Non-Coordination Approach and a Coordination Approach. Each of these approaches has distinct advantages that may facilitate the introduction and long-term success of ESVs. As discussed below, Stratos generally supports the implementation of both the Non-Coordination Approach and Coordination Approach for C-band ESV licensing.²⁶

1. Non-Coordination Approach

Under the Commission's proposed Non-Coordination Approach, ESV operations (i) would be licensed on a non-harmful interference basis for vessels 300 gross tons or larger; (ii) would require real-time tracking of vessel locations and real-time access to such tracking data on a secure basis; (iii) would not receive any protection from future terrestrial operations; and (iv)

²⁶ See *NPRM* at ¶ 92 (seeking comment on whether C-band ESV licensee should have the option of choosing either licensing approach proposed by the Commission).

would be authorized for a term of two years.²⁷ Instances of harmful interference would be resolved between the terrestrial operator and offending ESV licensee. To the extent the parties could not resolve the claim of harmful interference, the terrestrial operator could file a written complaint with the Commission and during the pendency of such a complaint the ESV network operator would be required to terminate or relocate (to another frequency or distant location) its ESV operations. The Non-Coordination Approach is essentially operation on a non-harmful interference basis as currently allowed under the Commission's rules, with a comprehensive statement of Commission requirements associated with such operation.

With one notable exception, Stratos supports the operation of C-band ESVs on a non-harmful interference basis as embodied in the Commission's Non-Coordination Approach proposal. C-band ESV licensees should be required to track ESVs operating within their networks in real time, but Stratos is concerned about the provision of real-time ESV location information to other parties on an open platform. Even if password-protected or secured by other means, this proposed requirement raises serious security concerns that should not be overlooked by the Commission. For example, U.S. government vessels utilizing ESV services may not want their exact positions disclosed under any circumstances, and operators of commercial and passenger vessels could also be understandably reluctant to reveal such information for competitive or security reasons.

While real-time ESV location information is useful to resolve interference, it is typically most useful to the ESV operator who can use it to pinpoint and correct problem. Thus, Stratos

²⁷ The ESV network operator also would be required to make available 24 hours a day and seven days a week a point of contact for its network and the name of the ESV operator(s) associated with its network, and maintain an accurate list of the vessels on which the ESVs are located; the frequency, bandwidth, and satellites that the ESVs are using; and an itinerary for each vessel from which the ESVs are operating in the network. *See NPRM* at ¶¶ 64-65.

supports a requirement to maintain real-time location information for ESVs operating within a network, and to retain the data for a reasonable period to assist in interference resolution. However, such information should be made available only upon request in the context of interference resolution or Commission enforcement activities.

The Non-Coordination Approach affords C-band ESV operators that can operate on a non-harmful interference basis a mechanism for commencing service on an expedited basis. Stratos believes that ESVs operators should continue to have the option of being authorized under such an approach.

2. Coordination Approach

Under the Commission's Coordination Approach, ESV operations: (i) would be licensed on a non-harmful interference basis for vessels 300 gross tons or larger; (ii) would require maintenance of vessels tracking data for 90 days and the provision of such tracking data within 72 hours upon request from the Commission or a frequency coordinator; (iii) would not receive any protection from future terrestrial operations; and (iv) would be authorized for a term of 15 years.²⁸ C-band ESV operators would be limited to 36 megahertz of uplink and 36 megahertz of downlink spectrum per satellite, per operator, per location (*e.g.* port and waterway) over a maximum of two FSS satellites in order to facilitate coordination with terrestrial FS systems.²⁹ The Commission also sought comment on whether it should identify a specific limited portion of the C-band in which all ESVs must operate, and encourage terrestrial FS operations to avoid use of that portion of spectrum unless there is no other C-band spectrum available for use.

²⁸ See *NPRM* at ¶ 70.

²⁹ Thus, under this approach, an ESV operator would be able to coordinate up to 72 megahertz of uplink spectrum and 72 megahertz of downlink spectrum per geographic location (one 36 megahertz transponder on each of two satellites).

Stratos generally supports the Coordination Approach to C-band ESV licensing set forth in the *NPRM*. However, Stratos is concerned about certain limitations on ESV use of C-band spectrum proposed by the Commission. Specifically, although limiting C-band ESVs to a single transponder on each of two satellites may facilitate coordination at individual geographic locations, there is no guarantee that the same 36 megahertz of spectrum could be coordinated by an ESV operator at other locations. Moreover, restricting ESV operations to a single transponder per satellite could constrain the ability of ESV operators to resolve interference issues by changing ESV transmit frequencies. Limiting all C-band ESV operators to a small portion of the band would compound the problem by further limiting operational flexibility, undermining the provision of ESV services at geographic locations where the selected frequencies are unavailable, and adding uncertainty with respect to the availability of C-band transponders to operate on the selected frequencies.

If the Commission concludes that it must limit ESV access to spectrum to facilitate coordination with U.S. terrestrial stations, the Commission should instead limit the amount of spectrum that may be coordinated by an ESV operator at any individual location -- but authorize the ESV operator to use the entire C-band beyond the minimum distance from the United States. This will allow U.S.-licensed ESV operators to use available C-band spectrum in open ocean areas beyond the minimum distance where terrestrial coordination is not an issue, and afford flexibility to coordinate available C-band spectrum at various ports and coastal areas and to re-coordinate or relocate ESV operations to different frequencies. This flexibility is particularly important because C-band ESVs may be required to modify their operations to accommodate future C-band microwave deployment.

In addition, while Stratos does not object to limiting the amount of spectrum an ESV coordinates at a given location to 72 megahertz (36 megahertz on each of two satellites), Stratos believes that an ESV operator should have the option of coordinating this spectrum for use with a single satellite. This will provide additional flexibility to ESV operators to resolve potential interference issues by changing operating frequencies to an entirely different transponder on the same satellite if necessary.

The Commission also requested comment on measures that could be implemented to provide C-band ESV operators some level of certainty that their operations can continue even if a terrestrial microwave station is constructed after the coordination is completed, such as encouraging frequency coordinators to avoid assigning new FS operations to frequencies coordinated for ESVs unless there is no alternative available and requiring a specific showing of need from terrestrial operators.³⁰ Stratos does not support any such limitations on the selection of frequencies for use by future C-band terrestrial stations.

Frequency selection for new C-band microwave facilities is a complex technical matter driven largely by existing terrestrial deployment and intra-service coordination concerns. Adding ESV frequency avoidance to the analysis would complicate the process significantly by constraining terrestrial deployment to non-ESV frequencies, which would raise congestion and potential interference concerns. In addition, frequency selection is closely related to a terrestrial operator's chosen link path, and it is not clear whether or how link path requirements would be factored into any proposed showing of need.

Imposing any restrictions on terrestrial frequency selection would unnecessarily complicate the terrestrial coordination process and would be inconsistent with authorizing C-

³⁰ See *NPRM* at ¶ 82

band ESV operations on a non-interference basis. Stratos believes, however, that C-band ESV operators would still take advantage of the Coordination Approach to ESV licensing to obtain the additional regulatory certainty associated with a 15-year license term.

With respect to the coordination methodology and interference criteria that should be adopted for C-band terrestrial/ESV coordination, Stratos supports the use of the Critical Contour Point method and related ITU recommendations to determine the potential for interference from ESVs into terrestrial FS stations.³¹ By using these detailed coordination procedures, Stratos believes that C-band ESV operations can be coordinated to fully protect co-primary terrestrial operations.

3. Minimum Distance

The Commission also requested comment on whether the 300 km minimum distance at C-band is appropriate, and how to protect fixed microwave links that extend into the Gulf of Mexico.³² Stratos operates the largest terrestrial microwave network in the Gulf region, including links that extend more than 100 miles into the Gulf. Stratos believes that a minimum distance of 300 km (approximately 185 miles) at C-band is adequate to protect its terrestrial network in the Gulf Region, including microwave stations on deep-water oil platforms.

Stratos could accept a smaller minimum distance (*e.g.*, 100 km) as long as the Commission includes the locations of Stratos' offshore terrestrial stations in defining the area within which C-band ESVs must be coordinated. Specifically, if the Commission adopts a minimum distance of less than 300 km, it should measure the minimum distance from the U.S. coastline *and* from U.S.-licensed offshore terrestrial stations up to a maximum distance of 300

³¹ *See id.*, ¶¶ 77-78.

³² *See id.*, ¶¶ 74, 75.

km from the U.S. coastline as specified in Resolution 902.³³ The Commission also should include future offshore C-band microwave stations in establishing the coordination area for C-band ESVs. Such an approach is necessary to account for future offshore C-band microwave facilities licensed to support new or relocated oil platforms, and will ensure that primary U.S.-licensed offshore C-band microwave stations are protected from interference and remain unconstrained by C-band ESVs to the same extent as U.S.-licensed microwave stations located on land.

C. Ku-Band Spectrum Sharing Issues

The *NPRM* also seeks comment on a number of spectrum sharing issues associated with Ku-band ESV operations. First, the Commission asked whether ESVs can share spectrum with secondary MSS services in the band.³⁴ ESVs and Ku-band MSS systems are designed to provide service using FSS satellite transponders and to protect adjacent FSS satellites by limiting the off-axis e.i.r.p. densities from their transmissions. Because ESVs are designed to operate in the FSS sharing environment, they are necessarily compatible with secondary MSS systems operating in FSS spectrum.

The Commission also requested comment on whether it should limit Ku-band ESV operations to only large vessels above 300 gross tons.³⁵ According to the Commission, vessels of this size are restricted to traveling in bodies of water of a certain depth, which could help keep

³³ For example, if the minimum distance is reduced to 100 km, the area in which C-band ESVs must be coordinated would include the area within 100 km from the U.S. coast *plus* the area within a 100 km radius of each U.S.-licensed offshore station (except to the extent that the latter area extended beyond 300 km).

³⁴ See *NPRM* at ¶ 35

³⁵ See *id.* at ¶ 54.

ESVs away from existing in-land Ku-band operations.³⁶ Although a minimum vessel size requirement is necessary in the C-band to protect incumbent terrestrial services by limiting C-band ESV operations to vessels using major shipping lanes and channels in and around the United States, the Ku-band is allocated for terrestrial services on a secondary basis and only lightly used by such services. These factors make the Ku-band ideal for inland and coastal ESV operations, particularly since Ku-band ESVs are typically smaller and thus better suited to provide services to smaller vessels operating in these areas. Accordingly, the Commission should not limit the ship size (and thus the geographic scope) of Ku-band ESV operations in the United States.

Additional band-specific issues are addressed below.

1. 11.7-12.2 GHz Band

In addition to primary FSS downlink operations, the 11.7-12.2 GHz band is used on a limited basis by the Local Television Transmission Service (“LTTS”).³⁷ The Commission requested comment on whether the LTTS allocation in the 11.7-12.2 GHz band should be eliminated because there are only 44 authorizations for LTTS use in the band, and the vast majority of those authorizations permit LTTS operations in other bands.³⁸ Given the limited use of the band and the availability of alternative spectrum, Stratos supports the removal of this allocation.

³⁶ *Id.*

³⁷ See 47 C.F.R. §§ 101.101, 101.147(a), 101.803(a) and (d).

³⁸ See *NPRM* at ¶ 31.

2. 14.0-14.5 GHz Band

The U.S. Table of Frequency Allocations includes a primary allocation for FSS uplinks in the 14.0-14.5 GHz band, provides for the protection of Radio Astronomy Service operations, and includes secondary allocations such as mobile (except aeronautical mobile), MSS, Space Research Service, and government terrestrial services in various portions of the band.³⁹

The 14.0-14.2 GHz band is allocated for the Space Research Service, and a portion of this spectrum is used by two U.S. Government space research Tracking and Data Relay Satellite System (“TDRSS”) facilities located in White Sands, New Mexico and Guam.⁴⁰ In addition, the 14.47-14.5 GHz band is used for Radio Astronomy Service (“RAS”).⁴¹ The Commission proposes (i) that Ku-band ESVs must be coordinated through the National Telecommunications and Information Administration (“NTIA”) Interdepartment Radio Advisory Committee (“IRAC”) before a license may be granted; and (ii) that Ku-band ESVs must ensure the protection of Space Research and Radio Astronomy operations. Stratos does not oppose an NTIA coordination requirement and protection requirements, but NTIA coordination should not be a prerequisite to granting an ESV license. Instead, successful coordination with NTIA should be a condition of any Ku-band ESV authorization that must be satisfied prior to commencing operations.

³⁹ See 47 C.F.R. § 2.106.

⁴⁰ There are plans to add another government TDRSS space research station in this portion of the Ku-band in either Langley, Virginia, or Wallops Island, Virginia. See *NPRM* at ¶ 34.

⁴¹ See *id.* at ¶ 39.

The 14.2-14.4 GHz band may be used on a limited basis for LTTS service.⁴² Like the LTTS allocation in the 11.7-12.2 GHz band, Stratos believes that the LTTS allocation at 14.2-14.4 GHz should be eliminated given the limited use of the band and the availability of alternative spectrum for such operations.

IV. THE COMMISSION SHOULD ADOPT BLANKET LICENSING PROCEDURES FOR ESV OPERATIONS BASED ON THE UNIQUE OPERATIONAL CHARACTERISTICS OF THE SERVICE

Blanket licensing is essential and appropriate in the context of C-band and Ku-band ESV operations. ESV operators will employ large numbers of technically identical ESVs operating on U.S. and foreign vessels in U.S., foreign and international waters throughout the world, making individual licensing of ESVs impractical. The Commission should develop appropriate licensing requirements in light of the operational circumstances of the service, the international regulatory and operational provisions governing ESVs adopted at WRC-03, and the needs of service providers to maintain flexibility in implementing their networks consistent with full protection of adjacent FSS satellites and other co-frequency services.

The Commission proposes that ESVs be authorized under blanket licensing requirements applicable to C-band small aperture terminals (“CSATs”) and Ku-band VSAT networks.⁴³ The Commission’s CSAT/VSAT routine licensing rules set forth minimum antenna performance requirements, including antenna size and antenna gain standards; and maximum earth station power levels.⁴⁴ If an earth station does not comply with these rules, it may still be licensed by

⁴² The Commission’s database reveals that there are only 25 LTTS licenses that include the 14.2-14.4 GHz band, but it is unclear whether any LTTS operations actually exist in this band. *See id.* at ¶ 37.

⁴³ *See generally NPRM* at ¶¶ 48-51, 84-85.

⁴⁴ *See* 47 C.F.R. §§ 25.134, 25.209.

the Commission but the applicant must submit additional information with its application, including a detailed interference analysis and affidavits from potentially affected satellite operators acknowledging that they do not object to the non-conforming operations.⁴⁵

Although larger C-band ESVs may satisfy the Commission's CSAT licensing requirements, smaller Ku-band ESVs (as small as 0.6m as permitted by Resolution 902) may be unable to meet the Commission's VSAT antenna performance requirements (*i.e.*, antenna gain pattern). Accordingly, at least for Ku-band ESVs, the Commission should adopt the off-axis e.i.r.p. density approach adopted by the ITU to govern ESV operations. However, ESV operations should cause no more interference to adjacent FSS satellites than an earth station that is compliant with the Commission's routine processing rules.

In addition, the Commission should adopt a minimum antenna size of 0.6 meters for Ku-band ESVs and 2.4 meters for C-band ESVs (the same minimum sizes noted in Resolution 902),⁴⁶ as well as the ESV antenna pointing accuracy requirement of +/- 0.2 degrees and the e.i.r.p. and e.i.r.p. spectral density limits towards the horizon included in Resolution 902.⁴⁷ Stratos supports the adoption of these provisions to ensure that U.S.-licensed ESVs comply with the requirements of Resolution 902.

Resolution 902 further provides that ESV operations within the minimum distances of a potentially concerned administration (125 km for Ku-band and 300 km for C-band) are subject to

⁴⁵ See 47 C.F.R. § 25.209(b).

⁴⁶ Resolution 902 expressly provides that administrations may authorize the deployment of 0.6 meter Ku-band ESVs so long as the interference to terrestrial services (*i.e.*, maximum power towards the horizon) is no greater than that of a 1.2 meter ESV. See ITU-R Resolution 902.

⁴⁷ This requirement is an important element in controlling off-axis e.i.r.p. and thus ensuring compatibility with adjacent FSS networks.

agreement with that administration, and operational procedures to facilitate such agreement are set forth in Recommendation 37 (WRC-03).⁴⁸ As a condition of an ESV blanket license, the Commission should require the operator to obtain the specific agreement of an administration prior to commencing commercial operations within the minimum distance from that administration's coastline, or to operate on a non-harmful interference basis only and in compliance with any requirements imposed by that administration on ESV operations.⁴⁹

V. OTHER OPERATIONAL CONSIDERATIONS FOR ESV NETWORKS

The *NPRM* suggests that C-band and Ku-band ESV licenses will only be issued for ESV operations within 300 km and 125 km of the U.S. coastline, respectively.⁵⁰ Stratos believes that the Commission must permit U.S.-licensed ESVs to operate in international and foreign waters beyond the distance suggested in the *NPRM*. Section 301(e) of the Communications Act plainly grants the Commission jurisdiction to license the operation of radio stations “upon any vessel or aircraft of the United States” without regard to the geographic location of the vessels,⁵¹ and U.S. ESV operators must not be placed at a competitive disadvantage by an unnecessary geographic limitation on ESV licensing.

The Commission also seeks comment on whether to permit U.S. ESV hub licensees to communicate with ESVs on board foreign vessels and whether to hold responsible the hub earth station licensee that controls the ESV network for resolving any harmful interference that may be

⁴⁸ See ITU-R Resolution 902 (WRC-03), Annex 1.

⁴⁹ These two alternatives are the same conditions proposed by the Commission to permit foreign-licensed ESVs to communicate with U.S. ESV hub licensees. See *NPRM* at ¶100.

⁵⁰ See *id.* at ¶ 73.

⁵¹ See 47 U.S.C. § 301(e).

caused by serving non-U.S.-flagged vessels.⁵² In addition, the Commission asks how foreign-licensed ESVs communicating with foreign-licensed hub earth stations should be treated when operating within the minimum distance from the United States.⁵³

Stratos agrees with the Commission that U.S. ESV hub licensees should be permitted to communicate with ESVs on board foreign-registered vessels licensed by a country with which the United States has entered into an ESV operational agreement, and ESV on foreign vessels operating within the minimum distance on a non-harmful interference basis only, provided that all of the Commission's technical rules are satisfied.⁵⁴ In addition, ESV licensees should be responsible for ensuring that all ESVs in its network comply with the Commission's rules, and should have the capability to inhibit operations and/or terminate service to ESVs operating within its network, including any ESVs operating on foreign vessels.⁵⁵

Stratos further believes that foreign-licensed C-band ESVs communicating with foreign hub earth stations while operating within the minimum distances from the United States should be strictly subject to the prior agreement of the United States. When a foreign-licensed ESV is communicating with a U.S.-licensed ESV hub earth station, the U.S. ESV hub licensee would have the ability to inhibit the transmissions of the foreign-licensed ESV in the event of interference. In the foreign ESV/foreign hub situation, however, there would be no U.S. licensee

⁵² See *NPRM* at ¶ 100.

⁵³ See *id.* at ¶¶ 101, 103.

⁵⁴ See *id.* at ¶ 100.

⁵⁵ The Commission proposes that ESV operators have the capability to inhibit operations and/or terminate service to ESVs operating within its network, including any ESVs operating on ships that are foreign-flagged. See *NPRM* at ¶¶ 54-55. Stratos agrees that ESV systems should be equipped with these types of control mechanisms to enable U.S. ESV licensees, who must ensure that all ESVs communicating with its network comply with the Commission's rules, to control remotely the operations of associated ESVs.

involved and the Commission will have no direct enforcement capabilities over the offending ESV. Accordingly, in order to protect terrestrial microwave facilities, such C-band ESV operations should be permitted only if the United States has executed an ESV operational agreement with the nation that licensed the foreign ESV network.⁵⁶

Finally, the Commission also sought comment on whether to apply its proposed ESV licensing regime to earth stations on oil rigs and other fixed platforms at sea, or if it would be more appropriate to license platforms as temporary fixed earth stations if the earth station is not operating while the platform is in motion.⁵⁷ Stratos opposes applying the ESV licensing regime to stationary (fixed) earth stations. The ESV licensing and service rules are designed primarily to address the operations of earth stations on vessels that are in motion. In contrast, while earth stations on-board oil rigs, river barges, and other maritime platforms may be stabilized to ensure proper antenna pointing at all times, they clearly fall within the definition of an FSS earth station.⁵⁸ Indeed, because such earth stations employ advanced stabilization mechanisms, they have substantially better pointing accuracy than the typical FSS CSAT and VSAT installations. In addition, such earth stations are typically compliant with the Commission's routine earth station licensing parameters. Accordingly, rather than being licensed as temporary fixed earth stations on an individual basis, the Commission should permit such earth stations to be operated

⁵⁶ Stratos does not believe that such a requirement is necessary for foreign Ku-band ESV operations because there are no co-primary terrestrial services in that band.

⁵⁷ See *NPRM* at ¶ 83.

⁵⁸ See 47 C.F.R. § 2.1(c) (defining "Fixed-Satellite Service" as "[a] radio communication service between *earth stations at given positions*, when one or more satellites is used; the given position may be a *specified fixed point or any fixed point within specified areas . . .*") (emphasis added). Because earth stations on stationary maritime platforms do not communicate while in motion, they satisfy the definition of an FSS service.

pursuant to a CSAT or VSAT network license, so long as the relevant antenna has been added as an authorized remote terminal to the earth station license.

VI. CONCLUSION

For the foregoing reasons, Stratos respectfully requests that the Commission promptly adopt Ku-band ESV licensing rules that are consistent with these comments.

Respectfully submitted,

STRATOS OFFSHORE SERVICES COMPANY

By: _____

Alfred M. Mamlet
Carlos M. Nalda
Steptoe & Johnson LLP
1330 Connecticut Avenue, NW
Washington, DC 20036
(202) 429-3000

*Counsel for Stratos Offshore Services
Company*

February 23, 2004